



[6450-01-P]

## DEPARTMENT OF ENERGY

### Record of Decision and Wetland/Floodplain Statement of Findings for the W.A.

### Parish Post-Combustion CO<sub>2</sub> Capture and Sequestration Project

**AGENCY:** Department of Energy

**ACTION:** Record of Decision

**SUMMARY:** The U.S. Department of Energy (DOE) announces its decision to provide cost-shared funding to NRG Energy, Inc. (NRG) for the W.A. Parish Post-Combustion CO<sub>2</sub> Capture and Sequestration Project (Parish PCCS Project) under DOE's Clean Coal Power Initiative (CCPI) Program. DOE prepared an environmental impact statement (EIS) to evaluate the potential environmental impacts associated with DOE's proposed action of providing financial assistance for the Parish PCCS Project. The EIS also evaluated the impacts associated with construction and operation of the proposed Parish PCCS Project, as submitted by NRG. DOE's proposed action is to provide limited financial assistance through a cooperative agreement with NRG for a new post-combustion carbon dioxide (CO<sub>2</sub>) capture and compression system that would be added to Unit 8 of the existing W.A. Parish power plant, with the captured CO<sub>2</sub> piped to the West Ranch oil field for use in enhanced oil recovery (EOR).

**ADDRESSES:** The EIS and this Record of Decision (ROD) are available on DOE's National Environmental Policy Act (NEPA) web site at <http://energy.gov/nepa/> and on

the DOE National Energy Technology Laboratory (NETL) web site at <http://www.netl.doe.gov/publications/others/nepa/index.html>. Copies of these documents may also be obtained by contacting Mr. Lusk, NEPA Document Manager, U.S. Department of Energy, National Energy Technology Laboratory, 3610 Collins Ferry Road, Morgantown, WV 26507-0880; telephone, 304-285-4145; or e-mail: *Mark.Lusk@netl.doe.gov*.

**FOR FURTHER INFORMATION CONTACT:** To obtain additional information about the project or the EIS, contact Mr. Mark W. Lusk at the address provided above. For general information on DOE's NEPA process, contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-54), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington DC 20585; telephone: 202-586-4600; or leave a toll free message at 1-800-472-2756.

**SUPPLEMENTARY INFORMATION:** DOE prepared this ROD pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321 et seq.), and in compliance with the Council on Environmental Quality (CEQ) implementing regulations for NEPA (40 Code of Federal Regulations [CFR] 1500 through 1508) and DOE's NEPA implementing procedures (10 CFR 1021) and DOE's Compliance with Floodplain and Wetland Environmental Review regulations (10 CFR Part 1022). This ROD is based on DOE's EIS for the W.A. Parish Post-Combustion CO<sub>2</sub> Capture and Sequestration Project (DOE/EIS-0473, February 2013) and other program considerations.

## **Background and Purpose and Need for Agency Action**

Public Law 107-63, enacted in November 2001, first provided funding for the CCPI program, a federal program to accelerate the commercial readiness of advanced technologies in existing and new coal-based power plants. The program encompasses a broad spectrum of commercial-scale demonstrations that target today's most pressing environmental challenges, including reducing mercury and greenhouse gas (GHG) emissions. When integrated with other DOE initiatives, the program will help the nation successfully commercialize advanced power systems to produce electricity at greater efficiencies, release almost no emissions, create fuels, and employ CO<sub>2</sub> management capabilities.

The purpose of DOE's proposed action under the CCPI program is to meet program goals by providing cost-shared funding for this proposed project to demonstrate the feasibility of advanced coal-based technologies at a commercial scale that capture and geologically sequester CO<sub>2</sub> emissions. The principal *need* addressed by DOE's proposed action is to satisfy the responsibility Congress imposed on DOE to demonstrate advanced coal-based technologies that can generate clean, reliable, and affordable electricity in the United States. Successful commercial-scale demonstration of amine-based carbon capture technology at NRG's W.A. Parish Plant with beneficial use of the CO<sub>2</sub> at an existing oil field would also generate technical, environmental, and financial data from the design, construction, and integrated operation of the CO<sub>2</sub> capture facility, pipeline, EOR, and CO<sub>2</sub> monitoring facilities at the oil field. These data would be used to evaluate whether

the deployed technologies could be effectively and economically implemented at a commercial scale.

### **NEPA Process**

DOE formally initiated the NEPA process by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register* (FR) on November 14, 2011, under Docket ID No. FR Doc. 2011–29333; (76 FR 70429). DOE conducted a scoping process that included two public scoping meetings and consultation with interested governmental agencies and stakeholders. DOE held public scoping meetings on November 30, 2011, in Needville, Texas, and December 1, 2011, in Edna, Texas. The public scoping period ended on December 15, 2011, after a 30-day opportunity to submit comments. The Environmental Protection Agency (EPA) and DOE both published a notice of availability (NOA) for the draft EIS on September 21, 2012. DOE's NOA (77 FR 58533) also announced its plans for two public hearings. Public hearings on the draft EIS were held in Thompsons, Texas, on October 10, 2012, and Edna, Texas, on October 11, 2012.

DOE received one verbal comment on the draft EIS at the two public hearings and listened to questions and concerns during informal sessions before the hearings. During the 45-day public comment period, which ended November 5, 2012, DOE received comment letters from the Department of Interior, EPA, and the Texas Parks and Wildlife Department. Comments included concerns about: (1) use of coal as fuel for electricity generation; (2) use of nitrogen dioxide (NO<sub>2</sub>) emission credits to offset volatile organic carbon (VOC) emissions; (3) use of horizontal directional drilling to cross under waterways; (4) mitigation of wetland impacts; (5) impacts on state or global rare plant

communities; (6) adequacy of the environmental justice analysis; (7) mitigation measures for construction-related emissions; (8) impacts on threatened and endangered species, including whooping cranes; (9) impacts to nesting bald eagles; (10) protection of freshwater mussel species; and (11) impacts on migratory birds. EPA rated the draft EIS as LO – “Lack of Objections”.

DOE distributed the final EIS during the last week of February 2013. The U. S. EPA published a NOA in the FR on March 8, 2013, (75 FR 28612). In the final EIS, DOE updated project information, refined analyses, and responded to comments on the draft EIS. DOE received no comments on the final EIS.

## **Decision**

DOE has decided to provide NRG with \$167 million in cost-shared funding for its proposed project through a cooperative agreement under DOE’s CCPI program. The project and its potential environmental impacts, as analyzed in the EIS, and required mitigation measures are described below.

## **Basis of Decision**

DOE based its decision on the importance of achieving the objectives of the CCPI program and a careful review of the potential environmental impacts presented in the EIS. The proposed project would help DOE meet its congressionally mandated mission to support advanced clean-coal technology projects. Post-combustion CO<sub>2</sub> capture offers the greatest near-term potential for reducing power sector CO<sub>2</sub> emissions because it can be used to retrofit existing coal-based power plants and can also be tuned for various levels of CO<sub>2</sub> capture, which may accelerate market acceptance. A successful

commercial-scale demonstration of amine-based carbon capture technology at NRG's W.A. Parish Plant with beneficial use of the CO<sub>2</sub> at an existing oil field would also generate technical, environmental, and financial data from the design, construction, and operation of the CO<sub>2</sub> capture facility, pipeline, and CO<sub>2</sub> monitoring facilities at the oil field. The data would be used to help DOE evaluate whether the deployed technologies could be effectively and economically implemented at a commercial scale.

This decision incorporates all practicable means to avoid or minimize environmental harm. DOE plans to verify the environmental impacts predicted in the EIS and the implementation of appropriate avoidance and mitigation measures.

### **Mitigation**

DOE's decision incorporates measures to avoid or minimize adverse environmental impacts during the design, construction and operation of the project. DOE requires that recipients of financial assistance comply with all applicable federal, state, and local environmental laws, orders, and regulations. During project planning, NRG incorporated various mitigation measures and anticipated permit requirements into its project, and the analyses completed for the EIS assumed that such measures would be implemented.

These measures are identified in Chapter 4 of the EIS, described as needed in each resource section of Chapter 3, and incorporated into this ROD as conditions for DOE's financial assistance under the cooperative agreement between DOE and NRG.

Additional mitigation measures or measures specific to certain impacts or comments received are further discussed below in the section entitled *Potential Environmental Impacts and Mitigation Measures*.

Mitigation measures beyond those typically specified in permit conditions will be addressed in a Mitigation Action Plan (MAP). DOE will prepare the MAP, consistent with 10 CFR 1021.331, to establish how the mitigation measures will be planned, implemented, and monitored. The MAP will be an adaptive management tool; therefore mitigation conditions in it would be removed if equivalent conditions are otherwise established by permit, license, or law. Compliance with permit, license or regulatory requirements is not considered mitigation subject to DOE control and would therefore not be included in a MAP.

DOE will ensure that commitments in the MAP are met through management of its cooperative agreement with NRG, which requires that NRG fulfill the monitoring and mitigation requirements specified in this ROD. DOE will make copies of the MAP available for inspection in the appropriate locations for a reasonable time. Copies of the MAP and any annual reports required by the MAP will also be available upon written request.

### **Project Description and Location**

The Parish PCCS Project would result in the construction and operation of a CO<sub>2</sub> capture facility utilizing an advanced amine-based absorption technology to capture at least 90 percent (approximately 1.6 million tons) of CO<sub>2</sub> annually from a flue gas slipstream taken from Unit 8 at the W.A. Parish Plant. This existing power plant is located on 4,880 acres in rural Fort Bend County within the incorporated area of the town of Thompsons, Texas. Up to 5,475 tons per day of captured CO<sub>2</sub> would be dried, compressed, and transported via a newly constructed approximately 81-mile long pipeline to the West Ranch oil field

where it would be used in EOR operations. The four primary components of the project are:

- (1) *CO<sub>2</sub> Capture Facility* - A post-combustion CO<sub>2</sub> capture facility would be constructed and attached to Unit 8 at the existing W.A. Parish Plant in Fort Bend County, Texas. A new 80-MW natural gas-fired turbine, currently under construction at the plant site, would produce the auxiliary electricity and steam needed by the CO<sub>2</sub> capture system.
- (2) *CO<sub>2</sub> Pipeline* - Captured CO<sub>2</sub> would be transported via a new, approximately 81-mile-long, 12-inch-diameter pipeline to the West Ranch oil field, located near Vanderbilt, Texas, in Jackson County. The pipeline route crosses mostly rural and sparsely-developed agricultural lands in Fort Bend, Wharton, and Jackson Counties. NRG plans to use existing mowed and maintained utility ROWs to the extent practicable to minimize environmental impacts and avoid sensitive resources. A joint venture between NRG and Hillcorp Energy Company (HEC), known as Texas Coastal Ventures LLC (TCV), would operate the pipeline.
- (3) *EOR Operations* - The proposed project would deliver up to 1.6 million tons of CO<sub>2</sub> per year to the West Ranch oil field for its use in EOR. The CO<sub>2</sub> would be injected into the 98-A, 41-A, Glasscock, and Greta sand units of the Frio Formation, approximately 5,000 to 6,300 feet below ground surface (bgs). The portions of the oil field in which EOR operations would be conducted are currently owned or leased by TCV. HEC has been contracted to conduct the EOR operations. TCV plans to make additional investments outside of the DOE



funded program to modernize and prepare the oil field to safely accept CO<sub>2</sub> injection, but the activities are included in this project description because they are integrated into the project concept and considered connected actions.

- (4) *CO<sub>2</sub> Monitoring Program* - TCV would implement a program to monitor the injection and migration of CO<sub>2</sub> within the geologic formations at the EOR site based on a CO<sub>2</sub> Monitoring Plan developed in cooperation with the Texas Bureau of Economic Geology (BEG). The monitoring program would be established and operated in accordance with requirements of the CCPI program and Railroad Commission of Texas (RRC) regulations for certification of CO<sub>2</sub> storage related to EOR operations (i.e., as specified in 16 TAC 5.305) and provisions of underground injection control permits for injection wells at the West Ranch oil field (i.e., existing permits for existing injection wells and new permits that would be required for newly installed injection wells).

The W.A. Parish Plant occupies an industrial area located next to relatively undeveloped lands. Scattered ranches and residences are located to the east and southwest, and Smithers Lake (a 2,430-acre man-made water body used for plant cooling water) is located to the north. The proposed CO<sub>2</sub> capture facility would have a footprint of approximately 400 feet by 400 feet (3.3 acres) within the existing W.A. Parish Plant. Including the CO<sub>2</sub> capture facility, the combustion turbine and heat recovery steam generator (CT/HRSG) area, two large laydown areas, and other project areas, a total of approximately 29 acres within the existing plant boundaries would be used during construction. Construction of the proposed project is planned to begin in mid-2013, at

the earliest, and would take approximately 24 months to complete. Within the existing plant site, up to 22 acres of land would be required for two temporary construction staging and laydown areas for storage of materials and equipment. Construction materials and equipment would be delivered by truck and rail. The number of workers would vary during the two-year construction period, ranging from 250 to 600 during the various phases of construction and averaging approximately 300 personnel. The largest demand for construction workers would likely occur approximately six months after the start of construction, when approximately 600 construction workers would be on site. Construction water needs would be supplied by the existing plant's water system. Electricity would be provided by on-site maintenance power sources or by new metered service from a local retail provider. Potential construction-related environmental impacts would be typical of those associated with a large industrial construction project and would primarily be related to air emissions, construction traffic, fugitive dust from disturbance, and storm water runoff from construction areas. Best management practices (BMPs) would be implemented and all necessary permits would be obtained to minimize potential impacts and to comply with regulatory requirements during construction. For the purposes of this EIS, DOE assumes the CO<sub>2</sub> capture system would continue to operate for 20 years. The capture facility and associated equipment installed as part of the project would require an increase of approximately 15 full-time personnel divided among shifts (i.e., an increase of approximately 4 percent over current conditions). Also, up to five additional new positions may be required at the plant.

During operation of the project, process-related chemicals would be transported to the W.A. Parish Plant either by truck or rail. In addition to regulatory requirements, NRG

would follow the chemical suppliers' recommendations and procedures in storing and handling all chemicals.

## **DOE's Proposed Action**

DOE's proposed action is to provide \$167 million in cost-shared funding through a cooperative agreement with NRG for its proposed project. DOE has already provided \$7 million to NRG under Phase I for preliminary design and related preliminary activities of the project, as described above. The estimated total project cost is \$845 million.

## **Alternatives**

Congress directed DOE to pursue the goals of the CCPI program by means of partial funding of projects owned and controlled by non-federal sponsors. This statutory requirement places DOE in a much more limited role than if it were the owner and operator of the project. Here, the purpose of, and need for, DOE action is defined by the CCPI program (and its enabling legislation, Public Law 107-63). Given these programmatic purposes and needs, reasonable alternatives available to DOE prior to the selection of this project under the CCPI program were other projects that met the eligibility requirements. Other applications (and their potential environmental, safety, and health impacts) were considered during the selection process. Pursuant to 10 CFR 1021.216, a publicly-available synopsis of the environmental review and critique completed for the selection process has been included as Appendix A of the EIS.

The alternatives considered by DOE were limited to the applications submitted to DOE in response to requirements specified in the CCPI Round 3 solicitation. DOE considered all the applications that met the mandatory eligibility requirements as expressed in the funding opportunity announcement. DOE's action concerning these applications was to

decide which projects would receive DOE financial assistance from among the eligible applications submitted. Unlike a project owned by DOE, when projects are selected in a competitive process in response to a funding opportunity announcement, DOE does not make decisions concerning the location, layout, design, or other features of the project. In other words, DOE must select among the eligible projects submitted to DOE by the applicants. DOE's initial decision is to select projects to receive federal financial assistance for a project definition phase prior to DOE's decision on whether to fund the project's construction and operation.

After DOE selects a project for an award, the range of reasonable alternatives becomes the project as proposed by the applicant, any alternatives still under consideration by the applicant, and the no-action alternative.

#### **No-Action Alternative**

Under the no-action alternative, DOE would not provide cost-shared funding for the proposed W.A. Parish PCCS Project. In the absence of DOE cost-shared funding, NRG could still elect to construct and operate the proposed project. Therefore, under the DOE no-action alternative, DOE assumes the proposed project would not be built or it would be built by NRG without the benefit of DOE funding.

DOE assumes that if NRG proceeded with project development in the absence of DOE funding, the project would include the features, attributes, and impacts as described for the proposed project. However, without DOE's participation, it is possible that the project would be canceled. Therefore, for the purposes of analysis in this EIS, DOE's no-action alternative is defined as the no-build alternative. This means that the project

would not be built and environmental conditions would not change from the current baseline (i.e., no new construction, resource use, or CO<sub>2</sub> capture and storage would occur).

Therefore, under the no-action alternative, the project technologies (i.e., large-scale CO<sub>2</sub> capture and geologic storage) may not be implemented in the near term. Consequently, timely commercialization of these technologies for large-scale, coal-fired electric generation facilities would be postponed and may not be realized. This scenario would not contribute to the CCPI goals to invest in the demonstration of advanced coal-based power generation technologies that capture and sequester, CO<sub>2</sub> emissions. While the no-action alternative would not satisfy the purpose and need for DOE's proposed action, this alternative was retained for comparison to the effects of the proposed project, as required under CEQ Regulations (40 CFR 15012.14). The no-action alternative reflects the current baseline condition and serves as a benchmark against which the effects of the proposed action can be evaluated.

NRG has begun construction and plans to operate certain individual project components such as the natural gas-fired turbine without DOE funding for other purposes not related to the Parish PCCS project. The construction of the natural gas-fired turbine would not be part of the cooperative agreement with DOE. This facility would begin operation in 2013 and would provide peaking power unrelated to the Parish PCCS Project. At a later date, possibly 2015, the natural gas-fired turbine would be used to power the compressors of the carbon capture facility. This would result in a variation of the no-action alternative that would have minor environmental impacts, primarily in the area of air quality. If

NRG decided to pursue the project without DOE funding, potential impacts would be similar to those evaluated under DOE's proposed action.

### **Potential Environmental Impacts and Mitigation Measures**

In making its decision, DOE considered the environmental impacts of NRG's proposed project, DOE's proposed action, and the no-action alternative on potentially affected environmental resource areas. These included: air quality and climate; greenhouse gas emissions; geology; physiography and soils; surface waters; ground water; floodplains; wetlands; biological resources; cultural resources; land use; aesthetics; traffic; transportation; noise; materials and waste management; human health and safety; utilities; community services; socioeconomics; and environmental justice. The EIS also considers the impacts from project facilities combined with those from other past, present and reasonably foreseeable future actions (i.e., cumulative impacts). The following sections discuss the potential impacts in these areas.

### **Air Quality and Climate**

Construction of the CO<sub>2</sub> capture facility, CO<sub>2</sub> pipeline, and CO<sub>2</sub> monitoring infrastructure would result in short-term, localized increased tailpipe and fugitive dust emissions.

Emission rates for criteria pollutants would be less than 1 percent of the total emissions in the region of influence (ROI), except PM<sub>10</sub> emissions during 2013, which would account for 3.1 percent of total ROI emissions. Emission rates for ozone precursors (i.e., VOC and nitrogen oxides [NO<sub>x</sub> ]) during the construction phase of the project would be lower than thresholds documented in the EPA rules for General Conformity (40 CFR 94.153).

Operational emissions from the pipeline corridor would be negligible. Operational emissions of criteria pollutants from the CO<sub>2</sub> capture facility and related infrastructure (e.g., CT/HRSG) and the CO<sub>2</sub> recycle facility would be less than 1 percent of the total emissions in the ROI. Operational emissions of NO<sub>x</sub> and VOC would exceed the thresholds documented in the Conformity Rules. NRG is required to obtain and retire 1.3 tons of credits or allowances, as applicable, for each ton of NO<sub>x</sub> and VOC emissions increase related to the proposed project. NRG owns and has assigned the appropriate amount of NO<sub>x</sub> emission credits approved for use in the Houston Galveston Brazoria Metropolitan Statistical Area (HGB MSA) to the Parish PCCS Project.

NRG would be required to purchase and retire 1.3 tons of credits or allowances, as applicable, for each ton of emission increase related to the proposed project. Due to the 1.3 to 1 retirement ratio of emission reduction credits and allowances, the proposed project would result in no net adverse impact on air quality in the HGB MSA with regard to ozone. Therefore, adverse impacts to air quality in the ROI due to operational emissions from the proposed project would be considered negligible to minor with some beneficial impacts in the form of elimination of sulfur dioxide and other emissions from Unit 8's flue gas slipstream.

As part of the state air permit application process, NRG was required to complete an air quality analysis to determine the effect of anticipated project air emissions on area air quality. The analysis included dispersion modeling, which compared the predicted ambient air quality concentrations to the National Ambient Air Quality Standards (NAAQS). The analysis supported the conclusion that predicted emissions resulting from the project would not cause or contribute to a violation of the NAAQS. The Texas



Commission on Environmental Quality (TCEQ) approved the analysis and issued the air permit on December 2012.

**MITIGATION:** To control fugitive dust, NRG must stabilize open piles and disturbed areas by covering and/or applying water or other dust control additive. NRG must also limit the speed of non-earthmoving equipment to 15 mph and earthmoving equipment to 10 mph to prevent spilling hauled materials. Disturbed areas shall be revegetated as soon as possible.

To control mobile and stationary source emissions, NRG must use modern, well-maintained diesel-powered equipment during construction and limit idling of heavy equipment. EPA recommended limiting idling to less than five minutes.

### **Greenhouse Gasses**

Construction of the CO<sub>2</sub> capture facility, CO<sub>2</sub> pipeline, and CO<sub>2</sub> monitoring infrastructure would generate up to approximately 4,900 tpy (4,400 metric tons per annum ) of CO<sub>2</sub> emissions over the two-year construction period. Operation of the CO<sub>2</sub> capture facility and CO<sub>2</sub> recycle facility would result in approximately 785,000 tpy (0.71 million metric tons per annum [MMTA]) of new CO<sub>2</sub> emissions. However, the proposed project would result in the capture of approximately 1.6 million tpy (1.5 MMTA) of existing CO<sub>2</sub> emissions, resulting in a net reduction of approximately 815,000 tpy (0.74 MMTA) of CO<sub>2</sub> emissions during operations.

The capture and geological storage of existing GHG emissions by the project would produce a minor beneficial cumulative effect on a national and global scale. The reduction in CO<sub>2</sub> emissions resulting from the Parish PCCS Project would incrementally

reduce the rate of GHG accumulation in the atmosphere and help to incrementally mitigate climate change related to atmospheric concentrations of GHGs.

**MITIGATION:** NRG must design and construct the Parish PCCS Project to capture at least 90 percent of the carbon in the fossil fuels when operating under normal conditions, and use best efforts to achieve at least a 90 percent capture rate during the demonstration period.

### **Geology**

Construction of the CO<sub>2</sub> capture facility, pipeline, and recycle facility would result in negligible impacts to geologic resources. New well construction in the EOR area would result in removal of geologic media through the drilling process. This process would not be unique to the area and would not affect the availability of local geologic resources. Existing wells used by the project would be reworked, resulting in a potential beneficial impact to geologic resources by reducing the risk of leakage.

Operation of the CO<sub>2</sub> capture facility and pipeline would not affect geologic resources. In the EOR area, the potential for CO<sub>2</sub> migration upward through the caprock seal is considered unlikely; however, leakage from one or more previously plugged and abandoned wells, oil-producing wells, injection wells, or observation wells might occur if any casing and/or cement placed in or around a well were to leak. To mitigate the potential for impacts related to casing or annular seal issues associated with wells in the proposed injection area, TCV would correct deficiencies prior to the use of such wells. These improvements to existing wells would result in a potential beneficial impact to geological resources by reducing the chance of leakage due to improperly sealed wells.

Preliminary reservoir modeling indicates that injected CO<sub>2</sub> and associated zones of increased pressure would not be expected to migrate laterally outside the area at the West Ranch oil field that is leased and operated by TCV. No known major faults exist within the West Ranch oil field or within the area of maximum predicted EOR-induced impacts to geologic formations. Therefore, the potential for the proposed project to increase seismic activity or for seismic activity to impact proposed project activities or facilities is low.

The addition of CO<sub>2</sub> to a geologic unit (i.e., a target geologic unit or an overlying unit, if leakage were to occur) could make the fluids within the unit more acidic. The creation of potentially more corrosive conditions could result in increased costs for later oil and gas development. However, DOE expects the injection of CO<sub>2</sub> to beneficially impact oil and gas resources at the West Ranch oil field by increasing production from the target geologic units. Furthermore, the presence of infrastructure for CO<sub>2</sub> floods may make oil production from other geologic units at the oil field more feasible, which could result in an indirect beneficial impact.

**MITIGATION:** NRG must develop a CO<sub>2</sub> monitoring plan, in coordination with the Texas Bureau of Economic Geology (BEG) and DOE, to account for the CO<sub>2</sub> used for EOR and ultimately sequestered. Subsequent reports submitted to the state of Texas must also be submitted to DOE.

### **Physiography and Soils**

Potential minor impacts to physiography and soils during construction would include disturbance of soils and the potential for increased soil erosion from grading, soil

excavation activities, earthwork compaction, and installation of impermeable surfaces over soils at some locations. At the CO<sub>2</sub> capture facility, up to 29 acres of soil within the plant boundary would be disturbed or lost. Soils in this area are classified as Prime Farmland, but they have been previously impacted and would not be used for agricultural purposes. For the proposed pipeline development, up to 1,197 acres of soils would be disturbed; however, the disturbed areas would be restored following construction and overall impacts would be minimized through use of existing ROW for most of its length. Approximately 819 acres in the construction ROW is classified as Prime Farmland and approximately 43 acres classified as more than slightly erodible (i.e., moderately to severely erodible). In agricultural areas, impacts to soil would be minimized by segregating topsoil from underlying soil and placing the topsoil back as the top layer when the trench is filled. For the EOR area, construction and operational activities would be conducted in existing operational areas; therefore, impacts to soils would be similar to existing impacts. Potential soil impacts in all construction areas would be avoided or mitigated as described in a project-specific storm water pollution prevention plan (SWPPP).

Operational activities associated with the CO<sub>2</sub> capture facility, CO<sub>2</sub> pipeline, and CO<sub>2</sub> monitoring infrastructure would be anticipated to result in negligible impacts to soil resources, primarily due to disturbance of soils from vehicle traffic and an increased potential for erosion.

## **Ground Water**

The potential for groundwater contamination during construction is considered low as potential spills and unintentional releases of wastes or petroleum-based materials to groundwater would be avoided or mitigated as described in a project-specific spill prevention, control and countermeasures (SPCC) plan.

Operation of the CO<sub>2</sub> capture facility would require an additional 0.2 to 0.3 million gallons per day (mgd) of groundwater from existing onsite wells (an approximately 13 percent increase as compared to current groundwater usage rates). The existing wells at the W.A. Parish Plant offer adequate capacity to supply the CO<sub>2</sub> capture facility with potential minor impacts to on-site groundwater supplies.

There are currently no plans to withdraw groundwater or to discharge directly to groundwater during construction of the proposed pipeline.

Water supply wells near the West Ranch oil field are not anticipated to be affected by injected or displaced fluids due to the relatively shallow depths of existing groundwater supply wells as compared to the depths of the proposed CO<sub>2</sub> injection wells in the Frio Formation (approximately 5,000 to 6,200 feet bgs) and the existing produced water injection wells in the Catahoula Sandstone (approximately 4,250 to 4,500 feet bgs); the presence of the approximately 400-foot-thick, low-permeability confining caprock formation (i.e., the Anahuac Formation) and the approximately 2,000-foot-thick low-permeability Burkeville confining system; and the absence of known faults in the EOR area.

DOE considers it unlikely that CO<sub>2</sub> would leak from the injection zone. However, the possibility exists for impacts to occur to shallower geologic units if leakage of CO<sub>2</sub> from

the injection reservoir units occurred. As part of the proposed CO<sub>2</sub> monitoring program, TCV and BEG would conduct studies to detect migration of injected or displaced fluids, should migration occur, so that potential long term impacts to groundwater resources may be minimized or avoided.

In the EOR area, the potential for CO<sub>2</sub> to migrate upward through fractures in the caprock seal is considered unlikely. However, leakage from one or more wells might occur if any casing and/or cement placed in or around a well failed. TCV and BEG would conduct well integrity testing prior to EOR operations and TCV would correct deficiencies prior to use of such wells in order to mitigate the potential for impacts. Additionally, existing wells used by the project would be reworked. Improvements to existing wells would result in a potential beneficial impact to groundwater resources by reducing the chance of leakage due to improperly sealed wells.

### **Surface Water**

Construction of project-related facilities has the potential to cause increased sedimentation and turbidity in adjacent water bodies and increase the potential for surface water contamination from material spills. A SWPPP would be developed and implemented to avoid or minimize potential impacts to surface waters during construction activities.

Negligible impacts to the surface water supply at the W.A. Parish Plant would be expected due to the approximately 12,000 gallons per day (gpd) required during construction for dust suppression, vehicle wash down, and other construction-related uses. Operation of the CO<sub>2</sub> capture facility (including supporting infrastructure and

facilities, such as the CT/HRSG and cooling water tower), would require approximately 3.5 to 4.9 mgd more surface water from Smithers Lake than is currently used by the W.A. Parish Plant. Including this approximately 10 percent increase in surface water usage, the plant would use a total of 38 to 55 mgd of surface water. Minor impacts on surface water supplies would be expected. NRG's projected surface water usage would also be well below its current 99 mgd of surface water rights.

During construction of the proposed pipeline, approximately 1.75 million gallons of water would be trucked in from outside sources or obtained from nearby surface water. NRG must discharge spent hydrostatic test water to upland areas according to RRC and EPA discharge permits and guidelines, as applicable. Additional mitigation measures, as identified in communication from the Texas Parks and Wildlife Department (TPWD) must be employed when crossing or working near Ecologically Significant Stream Segments. Some of these streams will be crossed using horizontal directional drilling (HDD) construction techniques. Crossings of the San Bernard River and Caney Creek are not expected to exacerbate existing water quality impairments in these water bodies. Construction-related impacts are expected to be negligible to moderate and temporary. Normal pipeline operations are not expected to impact surface waters.

Negligible to minor impacts to surface water features at the West Ranch oil field would be expected to occur as a result of construction activities within the proposed EOR area. During EOR operations, the potential exists for a CO<sub>2</sub> well blow-out, with some injected material being ejected and deposited into nearby surface waters. If that were to occur, such effects would be highly localized, minor, and readily remediated.

**MITIGATION:** NRG must implement the additional mitigation measures, e.g., double silt fencing, identified by the TPWD in a March 20, 2012, letter when crossing or working near Ecologically Significant Stream Segments during pipeline construction.

### **Floodplains and Wetlands**

In accordance with 10 CFR Part 1022 (DOE regulations on Compliance with Floodplain and Wetland Environmental Review Requirements), DOE considered the potential impacts of the proposed project and its connected actions on wetlands and floodplains in the affected area. An assessment of impacts to wetlands and floodplains is included in the EIS. NRG selected sites and a pipeline route that would minimize impacts to wetlands and floodplains, and has committed to implementing methods designed to further reduce impacts. Overall, the proposed project would result in minor, direct short-term impacts to wetlands and negligible impacts to floodplains.

No wetlands or floodplains exist within the area proposed for the CO<sub>2</sub> capture facility at the W.A. Parish Plant or within the area proposed for the CO<sub>2</sub> recycle facility at the West Ranch oil field. However, construction of project-related facilities has the potential to cause increased sedimentation and turbidity in adjacent wetlands and increase the potential for contamination from materials spills. A SWPPP utilizing appropriate spill prevention, control and countermeasures would be developed and implemented to avoid or minimize potential impacts to wetland and floodplain areas during construction activities, resulting in negligible to minor impacts.

Approximately 81 acres of wetlands would be temporarily impacted during pipeline construction and approximately 4 acres of wetlands may be permanently impacted.



Topsoil in wetland areas would be segregated from other excavated material during trenching and returned to the surface to promote revegetation of disturbed areas and to restore preexisting soil conditions. NRG plans to reduce the width of the construction ROW in wetland areas and/or use timber mats or low ground pressure equipment to minimize wetland impacts, as appropriate. Impacts to large riverine features and any adjacent wetlands would be avoided through the use of HDD methodology. Based on the current project design and field survey data collected to date, compensatory wetland mitigation would likely not be required for NRG's proposed project by the U.S. Army Corps of Engineers (USACE) or the state of Texas. At this time, DOE anticipates that wetland impacts will require Nationwide Permits for all stream and water body crossings. If conditions or plans become altered, any changes in permitting strategy or the need for compensatory wetland mitigation would come under the jurisdiction of the USACE. Mitigation requirements would be detailed as part of the permitting process.

The pipeline route would cross Federal Emergency Management Agency (FEMA) 100-year and 500-year floodplains in 25 locations. DOE does not expect that the minor, temporary impacts from construction would reach a level of endangering human health or property or conflict with any state, local, or federal floodplain ordinances or plans. Following pipeline installation, the construction ROW would be returned to its original topography to the extent practicable. Five main line valves would be constructed within the FEMA 100-year floodplain in Wharton County. Changes to the flood elevation or the flow of water in the floodplain as a result of these valves would be negligible. No other aboveground facilities are planned within floodplain areas. Additionally, BMPs (as specified in a site-specific SWPPP) would be implemented to avoid or minimize potential

impacts to wetland and floodplain areas during construction activities, resulting in negligible to minor impacts.

During pipeline operations, a 30-foot permanent ROW would be mowed and maintained along the pipeline route for pipeline inspection and maintenance activities, which could result in minor long-term impacts due to the potential changes to wetland quality and function in the approximately 31 acres of wetlands located within the proposed permanent ROW. Impacts to floodplains would be minor during pipeline operations.

DOE does not expect EOR operations or related CO<sub>2</sub> monitoring activities to impact floodplains or wetlands within the West Ranch oil field. Activities would be conducted on existing well pads and within existing ROWs as much as possible.

**MITIGATION:** NRG must implement the mitigation techniques described above and analyzed in the EIS, including but not limited to reducing the construction ROW width in wetland areas, use of timber mats or low ground pressure equipment, and the use of HDD to cross sensitive areas. If compensatory wetland mitigation becomes necessary as part of any USACE permit, NRG must implement additional mitigation as required and described in the permit.

### **Biological Resources**

Construction and operations activities at the CO<sub>2</sub> capture facility and EOR area would be expected to have negligible impacts to biological resources. Affected habitats at these locations have been disturbed by past and ongoing industrial and oil production activities. Impacts to wildlife from construction of the pipeline corridor would be negligible to minor. Approximately 75 percent of the proposed pipeline corridor would be constructed

within or immediately adjacent to existing mowed and maintained utility corridors. Also, approximately 60 percent of the pipeline corridor is currently in agricultural use, which is of limited use to wildlife. The pipeline route was chosen to minimize the overall effect to wildlife and fragmentation of wildlife habitat. Construction activities, including land clearing, would cause a negligible loss of wildlife habitat. The potential would exist for invasive species to colonize newly disturbed areas following construction, which could result in long-term moderate adverse impacts to biological resources. Except in cultivated fields or unless requested by the landowner, NRG would revegetate areas of disturbed soil along the pipeline construction ROW following construction with an appropriate mix of seeds for perennial grasses and forbs native to the area or with a seed mixture requested by the landowner to reduce the potential for establishment of invasive plant species. Depending on the season in which construction is completed, NRG may also seed with a cold-weather annual grass species, such as Gulf Coast ryegrass (*Lolium multiflorum*), to establish a temporary vegetative cover until conditions become favorable for growth of perennial grasses and forbs.

One active bald eagle nest was observed during field surveys in the ROI. The proposed pipeline route has been located approximately one mile from this nest, thus avoiding any impact.

One state-listed threatened mussel species (smooth pimpleback, *Quadrula houstonensis*) was observed during field surveys in the ROI. This species has also been proposed for federal listing. Impacts to this mussel species, and mussel habitat in general, would be avoided by using HDD and by careful placement of temporary water intakes and

discharges at this location. Similarly, HDD methodology will be employed at other river crossing locations classified as Ecologically Significant Stream Segments by the state of Texas.

NRG would limit land-clearing activities in previously undisturbed areas to periods outside of migratory birds' nesting seasons, to the extent practicable, to minimize the potential for impacts to migratory birds. If clearing vegetation during the nesting season or whooping crane migration period is unavoidable, previously undisturbed areas within the construction area would be surveyed prior to construction to verify that whooping cranes or nests with eggs or young would not be disturbed by construction activities. The proposed pipeline corridor would cross the whooping crane migratory pathway. Any areas being temporarily used by whooping cranes during its migration at the time of construction must be avoided until the cranes have left the area.

**MITIGATION:** NRG must continue consultation with the TPWD to minimize potential impacts on state-listed mussel species at pipeline crossings at larger rivers. As described in the EIS, HDD methods must be employed at these and other crossings, with appropriate actions taken to locate soil borings and temporary water intakes and discharges to minimize impacts to nearby mussel beds. If mussel relocations become necessary, NRG must coordinate its efforts with the TPWD.

NRG must avoid ground disturbing activities during migratory birds' nesting and breeding seasons to protect species protected by the Migratory Bird Treaty Act. If this is not practicable, a qualified biologist must survey potentially affected areas prior to ground disturbing activities and determine the appropriate actions needed to avoid impacts.

During the whooping crane migration period (late March to early April; and late October to mid-December), if whooping cranes are observed in areas planned for pipeline construction, NRG must temporarily suspend activities in those immediate areas until the cranes leave.

NRG, in coordination with DOE, must continue consultation with the TPWD and should request technical assistance from the USFWS if project changes require additional disturbance at new locations. This may occur if the currently proposed pipeline route needs to be altered or for other unforeseen areas of ground disturbance not included in the EIS. NRG must complete any additional surveys and identified mitigation prior to construction in those areas.

NRG must revegetate disturbed areas using methods approved by the state of Texas and with coordination with land owners.

### **Cultural Resources**

The THC identified the following Native American Tribes that may have an interest in activities in the proposed project area: the Alabama-Coushatta Tribe of Texas, the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Kiowa Indian Tribe of Oklahoma, the Mescalero Apache Tribe of the Mescalero Reservation, the Tonkawa Tribe of Indians of Oklahoma, and the Tunica-Biloxi Indian Tribe of Louisiana. DOE sent letters to these tribes, and only the Coushatta Tribe of Louisiana responded. The Coushatta Tribe of Louisiana concurred with DOE's findings of "no historical properties affected."

DOE determined, and the THC has concurred, that no impacts to historic properties listed, or eligible for listing, in the Nation Register of Historic Places (NRHP) would be expected from construction or operational activities for the CO<sub>2</sub> capture facility or EOR areas. Additionally, based on cultural resources survey data collected to date, DOE has determined that no historic properties listed, or eligible for listing, in the NRHP would be impacted by the construction and operation of the proposed pipeline. Additional investigation activities (i.e., mechanized trenching) found no deeply buried archaeological deposits at HDD entry and exit locations near several proposed river crossings. DOE submitted its findings regarding pipeline corridor surveys to the THC for review, and consultation with the THC is ongoing.

**MITIGATION:** NRG, in coordination with DOE, must continue consultation with the Texas Historical Commission (State Historical Preservation Office) for areas not previously surveyed for cultural resources. This may occur if the currently proposed pipeline route needs to be altered or for other unforeseen areas of ground disturbance not included in the EIS. NRG must complete any additional surveys prior to construction in those areas.

### **Land Use and Aesthetics**

The proposed construction and operation of the CO<sub>2</sub> capture facility at the W.A. Parish Plant and CO<sub>2</sub> monitoring infrastructure at the West Ranch oil field is consistent with existing land use and would result in negligible to minor impacts. Construction of the proposed CO<sub>2</sub> pipeline would temporarily impact approximately 386 acres of agricultural lands, but no permanent loss of agricultural lands would occur. Less than 0.3 acres

would be converted for aboveground pipeline facilities (one meter station and 12 main line valves).

Impacts to aesthetic values would be negligible at the CO<sub>2</sub> capture facility and EOR field as the existing aesthetic character would generally remain unchanged. Along the proposed CO<sub>2</sub> pipeline route, minor to moderate aesthetic impacts to adjacent property owners would occur in some locations due to construction noise, truck traffic, fugitive dust emissions, and vegetation clearing. Operational aesthetic impacts would be negligible to minor and would be related to placement of pipeline markers, periodic vegetation clearing, and other maintenance activities.

The impact of lighting during construction would be temporary and minor. The impact of lighting for operations at the proposed CO<sub>2</sub> capture facility, the CO<sub>2</sub> monitoring facilities, and the pipeline meter station would be negligible to minor as lighting would be consistent with existing operations. Lighting along the pipeline would be limited to the meter station. Meter station lighting would be down shielded to avoid interference with wildlife, which would result in minor impacts.

**MITIGATION:** NRG must install down-shielded lighting for permanent light needs wherever possible.

### **Traffic and Transportation**

A temporary increase in traffic during construction (up to 1,100 workers) is expected and would be easily accommodated by the existing road systems with only minor temporary disruptions. Continuing operation of the W.A. Parish Plant, the pipeline, and the West

Ranch oil field would have negligible effects as a relatively small number of commuting employees (10 to 15) would be added as well as a relatively small amount of additional material deliveries.

## **Noise**

Construction of the CO<sub>2</sub> capture facility would result an estimated 0.3 dB increase over existing noise levels for nearby receptors (i.e., nearby residential areas), which is below the threshold of human perception. Increased truck traffic during daytime hours may result in minor, short-term noise impacts along transportation corridors. Residences within 500 to 1,000 feet of pipeline construction would experience a short-term increase in ambient noise and vibrations from construction activity. Receptors near HDD locations could experience elevated temporary ambient noise levels as high as 78 dBA. Overall, noise and vibrations would result in minor to moderate impacts to receptors, depending on the distance from the receptor to the construction area. Construction and operations at the West Ranch oil field would result in an estimated 0.8 dB increase over existing noise levels for nearby individuals (i.e., in Vanderbilt), which is below the threshold of human perception, resulting in negligible to minor impacts to receptors.

## **Materials and Waste Management**

Construction materials, equipment and supplies are readily available within the ROI and quantities required to support the proposed project are expected to be well within the capacity of material suppliers. Some specialized equipment may be required from outside the ROI; however, it is expected that this equipment would also be within



existing supplier capacities. As a result, impacts to regional and national construction material resources and special equipment suppliers would be negligible.

The W.A. Parish Plant is currently a conditionally exempt small quantity generator and generates approximately 200 pounds of hazardous waste per year. During operations, the generation of approximately 2,712 pounds per day of reclaimer effluent, a hazardous material, would cause the plant to be classified as a large quantity generator.

Approximately 24 shipments of reclaimer effluent would be sent to a permitted treatment, storage and disposal facility (TSDF) per year. The amounts sent for disposal would not substantially affect the capacities of the TSDF selected.

Adequate non-hazardous solid waste disposal capacity exists within the ROI. Based on the over 20 million tons of capacity available in regional waste disposal facilities and the relatively low volumes of solid waste that would be generated by the proposed project (e.g., up to approximately 60 tons per year from the CO<sub>2</sub> capture facility), adequate regional capacity exists for solid waste disposal with negligible impacts to waste management service providers.

### **Human Health and Safety**

The potential for worker injuries and fatalities would be present during the construction of the proposed CO<sub>2</sub> capture facility, CO<sub>2</sub> pipeline, and CO<sub>2</sub> monitoring infrastructure. Based on historical records for related industries, no worker fatalities would be expected. During facility operation, workers could be subject to physical and chemical hazards, which would be typical of those associated with similar power plant, pipeline, and oil

field operations. An estimated nine to 12 OSHA recordable incidents would be anticipated during project construction based on national incidence rates for comparable industries.

A human health risk assessment was performed for the EIS to analyze the potential health and safety impacts associated with CO<sub>2</sub> and amine releases from proposed project components. The potential for CO<sub>2</sub> pipeline ruptures or punctures is considered to be unlikely. The upper bound impact from a pipeline release of CO<sub>2</sub> would be transient and reversible effects for up to 12 people. More severe impacts would affect less than one person for all other pipeline release scenarios. If a release were to occur with workers present, the workers would likely experience the physical effects of an accident or a higher concentration exposure to CO<sub>2</sub> than the surrounding population. Potential exposure would be limited because the pipeline would be buried underground.

Additionally, NRG plans to install 12 main line valves to stop the release of CO<sub>2</sub> should a puncture or rupture occur. These valves, along with pipeline pressure monitoring equipment, would be linked to the CO<sub>2</sub> capture system operations control room, which would be staffed at all times when the system is in operation. In the event of a pressure drop indicating a pipeline rupture, the control room operator would shut down the system and remotely activate the main line valves to prevent further damage to the pipeline and minimize impacts to people in the surrounding area and the environment.

The potential for release of CO<sub>2</sub> from the EOR area is considered to range from unlikely to incredible (i.e., extremely unlikely), with less than one person affected for all release scenarios. In the extremely unlikely occurrence of an injection well blowout, the main adverse outcome would be the potential for ejection of CO<sub>2</sub>, possibly as dry ice particles, and formation fluids from the wellhead. Effects would be expected to be localized to the

area around the affected wellhead and events of this type would be avoided or minimized by incorporating high pressure piping, overpressure protection valves, and blowout preventers into the design of the injection wells. A leak of amine-based solvent from a storage tank was also evaluated. Such a release would be unlikely and effects would be confined to the plant property. No nearby residents or the general public in the vicinity of the plant would be affected. Plant workers would need to take appropriate response actions, since life-threatening concentrations of the solvent in air could occur within the plant site to a distance of 0.3 miles from the release. No nearby residents or other individuals in the vicinity of the plant would be affected beyond mild irritation if an amine-based solvent tank release occurred, although an odor may be detectable depending on wind conditions.

## **Utilities**

The construction and operations phases of the proposed project would increase demand for potable and industrial water; and wastewater treatment services. Construction-related impacts to water supplies would be short term and negligible to minor. Construction-related impacts to wastewater treatment would be negligible. Operations impacts to water supplies would be negligible. Operations of the CO<sub>2</sub> capture facility would result in negligible impacts to the natural gas supply as compared to existing use (i.e., much less than 1 percent of the current maximum usage).

EOR operations may require additional natural gas supply and electricity, which may result in minor impacts to the local utility infrastructure. Beneficial impacts to oil

supplies would be provided in the long term as a result of increased production of oil in the ROI as a result of EOR operations.

### **Community Services**

A temporary workforce of up to 1,100 workers would be required for construction of the proposed project. Long-term operation of the project would require up to 20 new employees. Many of these workers are expected to be employed from within the ROI. Negligible impacts on community services would be expected due to a relatively small population increase during the construction and operation phases of the Parish PCCS Project. Existing community services (i.e., law enforcement, emergency response, hospitals, and education) are expected to be adequate to address the needs of the population in the ROI, including project personnel.

### **Socioeconomics**

The project would be expected to contribute minor, long-term, beneficial impacts on the local economy and employment activities, as well as taxes and revenue through increased employment opportunities and expenditures in the local economy. Housing demand may increase slightly during construction if a portion of the 1,100 construction workers temporarily relocate to the area; however, this would be a negligible, short-term effect. TCV estimates that using CO<sub>2</sub> floods (i.e., EOR), the West Ranch oil field could produce an additional 55 to 75 million barrels of oil. This projected increase in oil production would translate directly into additional revenues for the State of Texas, even after taking into account the tax exemptions related to use of CO<sub>2</sub> from anthropogenic sources for EOR.

## **Environmental Justice**

Three census tracts in the ROI qualify as minority environmental justice areas of concern using the threshold of 50 percent minority in the corresponding county. However, the proposed project is not expected to have disproportionately high and adverse human health or environmental impacts on minority populations. The overall impacts of the proposed project would be negligible or minor, depending on the resource area evaluated, and would not be directed at any particular minority group. Significant or adverse impacts on potential environmental justice areas of concern would not occur. In addition, the proposed project is expected to create economic benefits for local communities, regardless of race, by generating employment opportunities, local expenditures by workers, and compensation for proposed project-related easements to local landowners. Mitigation measures for resource areas impacted have been identified to further reduce environmental impacts and adhere to policies and regulations for the protection of the environment and local public health. Therefore, the proposed project would not create disproportionately high and adverse human health or environmental impacts on minority populations during construction or operation.

Because there is no low-income population in the ROI to be affected, there would be no adverse environmental justice impacts associated with the proposed project. However, DOE expects the proposed project would create economic benefits for local communities during construction and operation.

## **Potential Environmental Impacts of the No-Action Alternative**

Under the no-action alternative, DOE assumed the only development at the facility would be the construction and operation of a natural gas-fired turbine at the W.A. Parish Plant that would begin operation in 2013. The impacts under the no-action alternative (i.e. no development) were evaluated in the EIS and compared to the proposed action.

Under the no-action alternative, the W.A. Parish Plant, pipeline corridor, and the EOR area at the West Ranch oil field would remain in their current condition with respect to the following: geologic resources; physiography and soils; groundwater resources; surface waters; wetlands and floodplains; biological resources; cultural resources; land use and aesthetic resources; noise; material use and waste generation; human health and safety; community services; and environmental justice.

Construction and operation of a natural gas-fired turbine at the W.A. Parish Plant under the no-action alternative would be a new source with emissions of criteria pollutants and GHG. The criteria pollutant emissions associated with the facility are estimated to be: 102.1 tpy of CO, 37.6 tpy of NO<sub>x</sub>, 75.1 tpy of PM<sub>10</sub>, 71.7 tpy of PM<sub>2.5</sub>, 6.9 tpy of SO<sub>2</sub>, and 12.88 tpy of VOC. These potential emission increases were evaluated by TCEQ, and are authorized in the permit that it issued on December 21, 2012. The GHG emissions associated with the turbine are estimated to be: 582,328 tpy of CO<sub>2</sub>, 2.44 tpy of H<sub>2</sub>SO<sub>4</sub>, and 34.2 tpy of NH<sub>3</sub>. Since there will be no emission reductions to offset the emission increases from the turbine; there would be an overall increase in GHG emissions. These GHG emission increases would have to be authorized under a PSD permit from the EPA.

There would also be no commercial-scale demonstration of advanced coal-based power generation technologies to capture CO<sub>2</sub> for EOR and ultimate sequestration.

Construction of the natural gas-fired turbine at the W.A. Parish Plant would temporarily increase traffic during construction (up to 100 workers), but would be easily accommodated by the existing road systems with only minor temporary disruptions. The personnel employed during construction of the turbine would result in minor short-term beneficial impacts by consumption of goods and services. Construction of the natural gas-fired turbine would likely result in a moderate, beneficial impact to taxes and revenue within the ROI.

The construction and operations phases of the natural gas-fired turbine would increase demand for potable and industrial water; and wastewater treatment services.

Construction-related impacts to water supplies would be short term and negligible to minor. Construction-related impacts to wastewater treatment would be negligible.

Operations impacts to water supplies would be negligible. Operations of the turbine would result in negligible impacts to the natural gas supply as compared to existing use (i.e., much less than 1 percent of the current maximum usage). The turbine would supply electricity that would be available for commercial sale through the power grid, and would be a beneficial impact until the electricity and steam are needed for the capture facility.

### **Environmentally Preferred Alternative**

From a local perspective, the no-action alternative is the environmentally preferable alternative because it would result in no changes to the existing environmental conditions, with the exception of the natural gas-fired turbine, which NRG has begun

constructing and plans to operate with or without DOE funding. However, from a national perspective, DOE's proposed action is the environmentally preferred alternative. Successful demonstration of the proposed project could facilitate the deployment of carbon capture, utilization and storage (sequestration) practices at power plants and other industrial facilities in an effort to reduce greenhouse gas emissions that would otherwise occur with the continued combustion of fossil fuels, especially coal, from large stationary sources.

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